SATPREP

Assignment : Integration by parts

1. $\int xe^x \, dx$

2. $\int x\cos x \, dx$

3. $\int xe^{-4x} \, dx$

4. $\int \ln x \, dx$

5. $\int \arcsin x \, dx$

6. $\int \arctan x \, dx$

7. $\int e^x \sin x \, dx$

8. $\int \sin^2 x \, dx$

9. $\int \cos^2 x \, dx$

10. $\int x^2 e^{-3x} \, dx$

11. $\int \frac{x^3}{(x^2+2)^2} \, dx$

Answer

1.) $xe^x - e^x + C$ 2.) $x\sin x + \cos x + C$ 3.) $-\frac{1}{16}e^{-4x} - \frac{1}{4}xe^{-4x} + C$ 4.) $x\ln x - x + C$

5.) $x\arcsin x + \sqrt{1-x^2} + C$ 6.) $x\arctan x - \frac{1}{2}\ln\left(x^2+1\right) + C$ 7.) $\frac{1}{2}e^x\left(\sin x - \cos x\right) + C$

8.) $\frac{1}{2}\left(-\sin x\cos x + x\right) + C$ 9.) $\frac{1}{2}\left(x + \sin x\cos x\right) + C$ 10.) $-e^{-3x}\left(\frac{1}{3}x^2 + \frac{2}{9}x + \frac{2}{27}\right)$

11.) $\frac{1}{2}\ln\left(x^2+2\right) + \frac{1}{x^2+2} + C$